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1972 - 73 Progress Report

PLANT PROTECTION AND QUARANTINE PROGRAMS

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Animal And Plant Health Inspection Service
UNITED STATES DEPARTMENT OF AGRICULTURE

Issued April 1974

This is the first Progress Report issued since the consolidation of Plant Protection and Agricultural Quarantine Inspection into a single unit—Plant Protection and Quarantine Programs. Reporting is on a fiscal year basis. This report covers a period of 2 years for Agricultural Quarantine Inspection and 18 months for Plant Protection.

This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal Agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.



Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture or an endorsement by the Department over other products not mentioned.

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1972-73 Progress Report₁

Plant Protection and Quarantine Programs

INTRODUCTION

The Animal and Plant Health Inspection Service (APHIS), is the newest Agency of the U.S. Department of Agriculture. It was created by merging the regulatory functions of the Agricultural Research Service with meat and poultry inspection programs from the old Consumer and Marketing Service. The purpose of this merger was to provide a faster, more effective response to today's problems—problems interwoven with complex and occasionally conflicting agricultural, environmental, and consumer protection issues.

Like its parent Agency, Plant Protection and Quarantine Programs (PPQ) is the product of a merger. The Plant Protection Division and the Agricultural Quarantine Inspection Division were consolidated soon after their transfer to APHIS from the Department's Agricultural Research Service (ARS).

The most significant organizational changes brought about by the latter merger were:

1. Formation of a new Pest Survey and Technical Support Staff,
2. Unified plant protection and quarantine Methods Development and Regulatory Services Staffs,
3. Creation of new Ecological Evaluations and Emergency Programs units, and
4. Consolidation of the regional structures of the two divisions.

Consolidation of PPQ functions includes cross-training and cross-utilization of Plant Protection inspectors and Agricultural Quarantine inspectors. In the future, inspectors will be able to handle any PPQ emergency—regardless of its relationship to their immediate job.

Increasing concern with pesticides, as they relate to environmental and human health problems, has spurred department-wide efforts to find and develop nonchemical methods of pest control. No action is taken in any cooperative control project until PPQ scientists evaluate the environmental, biological and economic impact of applying different suppression or eradication methods, balancing them against the consequences of taking no action at all.

Biological controls—such as sterile insect releases, mass trapping, rearing and release of parasites and predators, and the use of insect diseases—are being substituted for chemicals wherever possible in PPQ pest control projects. The most far-reaching activity, however, is PPQ's involvement in the Department's pest management program. The ultimate objective of this all-out effort is to achieve pest control based on sound ecological principles. This will involve combining chemical, biological and cultural methods into a practical, unified control system.

AIRCRAFT OPERATIONS

PPQ aircraft were used to test new materials on a number of programs. This included: spraying tests on gypsy moth, grasshoppers, range caterpillar and citrus blackfly; spraying 100-micron capsules containing disparlure on gypsy moth; dispersing 100-micron capsules containing mirex in dry form at 100 grams total volume per acre on imported fire ant; applying cork and paper confetti coated with disparlure on gypsy moth; releasing small traps, coated internally with adhesive and disparlure, on gypsy moth; and releasing sterile boll weevil in field tests.

Two aircraft have been equipped with aerial cameras and closed-circuit television. They were used for color infrared photography on the witchweed, West Indian sugarcane root borer, burrowing nematodes and gypsy moth programs in the United States, and on the citrus blackfly program in Mexico. The core area of the boll weevil eradication trial in Mississippi was photomapped in black and white. Mapping photography with color negative film was accomplished on the tobacco pest management program. Testing of various film/filter combinations on the gypsy moth program was compared with NASA's earth resources and Skylab imagery. Other photography was obtained for various citrus pest programs in cooperation with ARS.

Other activities included contract supervision on boll weevil, imported fire ant, and grasshopper programs and defoliation survey on gypsy moth.

BARBERRY ERADICATION

A mild winter in the Southern United States in 1972 allowed stem rust to move into northern wheat areas a week or two earlier than normal. The Department's long-time involvement in an effective barberry control program, and widespread planting of resistant varieties of wheat prevented a disastrous rust epidemic.

The severity of stem rust was much lighter in the Southern States in the spring of 1973. Cool weather in May and June slowed northern progress of the rust. Of major importance was the absence of race 15 in the South and preponderance of race groups 11, 32, 113, and 151. The latter contains some potentially dangerous cultures.

Nineteen important grain-growing States are cooperating in the barberry eradication program. Of the original 1,073,000 square miles scheduled for barberry eradication work, only a little over 14,000 square miles remain to be placed on maintenance. During the reporting period, 3,177,968 susceptible barberry plants were destroyed and 1,087 square miles placed on maintenance.

BEET LEAFHOPPER

In the spring of 1973, economic populations were reported on 5,000 acres of Bureau of Land Management, U.S. Department of the Interior, reseeded rangeland in Malheur County, Ore. Oregon State University cooperated in testing the efficacy of ULV malathion for labeling purposes. Six- and eight-ounces-per-acre rates were used on 160-acre plots. Both rates are effective.

BOLL WEEVIL—TEXAS HIGH PLAINS

The boll weevil diapause control program on the Texas High Plains has effectively prevented westward spread of the pest to Arizona, California and New Mexico. Control work in the Big Bend area of Texas, along the Texas-Mexico border, has prevented build-up and spread from that area.

A total of 514,131 aggregate acres was treated in 1972. Treatment on an "as needed" basis was expanded to the entire control zone in 1972 and was continued in 1973. Weekly surveys identify cotton fields requiring control.

The use of the systemic insecticide, Aldicarb, in trap crops near hibernation sites was expanded in 1973. These newer pest management concepts, properly applied, provide effective control while using less pesticides.

Several new insecticide formulations will be tested in 1973 using malathion and Guthion as standards. A large-scale field trial is proposed for the Texas High Plains in the fall of 1973 and the spring of 1974 to integrate proven techniques of the Mississippi eradication trial into program operations.

BOLL WEAVID ERADICATION TRIAL

The boll weevil eradication trial was initiated in July 1971 on approximately 24,000 acres of cotton in 50 counties in south-central Mississippi and adjacent areas of Alabama and Louisiana. It is being conducted by a special team of Plant Protection and Quarantine personnel in cooperation with other Federal and State agencies and industry. The trial integrates a series of population suppression techniques, including diapause control treatments, defoliation and stalk shredding in the fall, concentrated trapping and ground trash sampling, early fruiting trap crop cotton baited with a pheromone and treated with a systemic pesticide, a single pesticide application as weevils emerge in the spring, and the release of laboratory reared, chemically sterilized weevils in late spring and early summer.

This 2-year trial will be completed early in August 1973. At this time, the results look very favorable.

BURROWING NEMATODE

The U.S. Department of Agriculture and the State of Florida have signed a supplement to their Memorandum of Understanding to the effect, "that the USDA will phase out of the burrowing nematode program at a rate of approximately 20 percent per year." The Citrus Industry Spreading Decline Commission recommended this change in policy.

During this reporting period, detection surveys were conducted on 15,939 acres. Other surveys were conducted on 42,533 acres. The laboratory processed 153,067 root samples. Initial infestations were found on 398 acres and 1,186 acres were treated. About 58,723 lineal feet of chemical barriers were established, and 2,506,484 lineal feet of barriers were maintained.

CARIBBEAN FRUIT FLY

A Federal-State experiment initiated in 1971 to determine if Caribbean fruit fly infestations could be eliminated through sterile releases was completed in June 1972. The test site was Key West, Fla. Rearing methods were developed by the University of Florida at their laboratory in Homestead. The flies were irradiated in the Entomology Research, ARS, Caribbean fruit fly laboratory in Miami. Evaluation of test results was carried out by the Florida State Division of Plant Industry. Plant Protection and Quarantine developed techniques for releasing flies by air in a freefall method. All air releases were made under contract by private operator.

Initial release numbers proved inadequate. After three ULV malathion sprays were applied to reduce populations, sterile fly numbers were increased until the overflooding ratio exceeded 50:1. These releases were terminated on April 20, 1972. By June 3, 1972, trap catches of native flies had reached zero. PPQ participation was terminated on June 30, 1972, except for the continuation of studies on population trends in conjunction with Mediterranean fruit fly surveys.

CEREAL LEAF BEETLE

The cereal leaf beetle was not detected in new areas west of the Mississippi River, despite intensive spring 1973 surveys in Iowa, Minnesota, Missouri and Wisconsin. Infestations found in two counties in New Jersey, next to infested counties in Pennsylvania, added New Jersey to the infested list. Surveys to date have established infestations in 584 counties in the following states: Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and Wisconsin.

A notice to hold a public hearing¹ was issued to determine the continuing need of the 4-year old quarantine June 21, 1973. While no long-range artificial spread has occurred, the yearly natural spread raises the question of the value and effectiveness of continuing the Federal quarantine.

Cereal leaf beetle parasite releases were continued in 1973. The egg parasite was released at 184 field sites in six States. The larval parasites were released in 145 sites in seven States, including releases in 12 field insectaries. A total of 859,051 parasites was released: 519,750 egg parasites and 339,301 larval parasites. Since 1967, the egg parasite has been released in nine States, and the three larval parasites have been released in seven States.

The recovery of parasites released since 1967 is encouraging. Larval parasites have been recovered from 16 counties in five States: Indiana, Michigan, Ohio, Pennsylvania, and West Virginia. Egg parasites have been recovered from 59 counties in the States of Indiana, Michigan, New York, Ohio, West Virginia, and Pennsylvania. The establishment of parasites and their natural dispersal is the major program function. Suppressing cereal leaf beetle populations in the infested States is expected to reduce small grain losses and to delay natural spread.

¹ Revoked Oct. 1, 1973.



Figure 1—Parasites attacking cereal leaf beetle egg.



Figure 2—Parasites attacking cereal leaf beetle larva.

CITRUS BLACKFLY

An infestation of citrus blackfly was detected in the residential area of Brownsville, Tex., in April 1971. Pest spread occurred despite intensive control efforts. By September 1972, infestations had been detected to the north and west of Brownsville in groves near Los Fresnos and in dooryard plantings in Mission. Surveys in Mexico revealed that Matamoros, Valle Hermosa, and Reynosa, Tamaulipas, Mexico, were generally infested.

To more accurately determine the bounds of the infestation, an intensified biometrically designed survey was begun in December 1972. One-hundred thousand sites were examined in an area extending from the Gulf of Mexico up the Rio Grande for approximately 250 miles, and extending 80 miles each side of the border.

The survey revealed scattered infestations throughout southern and western Cameron County in Texas and several additional border cities in northeast Mexico. Infestations in Texas and northeast Mexico border areas principally consist of individual trees or small infestations that do not link up.

Treatments were applied to all infestations when found. In Texas, by June 30, 1973, only two properties in northwest Brownsville were known to contain active infestations.

Utilization of infrared photography in surveying commercial citrus groves in northeast Mexico improved APHIS' ability to quickly detect citrus blackfly population buildups. Surveys in December 1972 found 26 new infestations. Pinpointing of spot infestations with infrared photography—followed by limited use of pesticides within those areas—prevents the drastic reductions in parasite populations that frequently accompany widespread pesticide use.

Methods development was given space at the ARS laboratory in General Teran, Nuevo Leon, Mexico, to begin screening tests of additional insecticides. Field tests to compare various application techniques and candidate insecticides were postponed due to low citrus blackfly population levels in northeast Mexico (the result of an extended heat wave).

ECOLOGICAL EVALUATIONS

Creation of the Environmental Protection Agency included transfer of the Animal and Plant Health Inspection Service's program of monitoring pesticide residues within the environment. To correct this void, the Ecological Evaluations Staff was organized in September 1971 as part of Plant Protection and Quarantine Programs. The Environmental Quality Laboratory in Gulfport, Miss., became fully operational for the 1972 season.

The responsibilities of this group include determining the levels of pesticide residues in the environment and the efficacy of PPQ control programs. During 1972 and 1973, these activities were mainly centered around the imported fire ant/mirex program.

The sampling unit designated for monitoring and efficacy activities was a 10-acre site, representing approximately 20,000 acres. These sites were randomly selected throughout the entire imported fire ant treatment area. Approximately 350 such sites were sampled in spring 1972, 650 sites in fall 1972, and 300 sites in spring 1973. Environmental components sampled included soil, water, vegetation, sediment, mammals, birds, fish, and crayfish, field crickets and ground beetles.

In January 1973, computerized automatic gas chromatographic instrumentation was installed in the Gulfport laboratory. This automated analytical system can reduce the time required to analyze 1,000 samples from approximately 3 months to 2 weeks. A terminal was also installed to transmit pesticide residue data for storage at the New Orleans Computer Center.

Although mirex residues from the imported fire ant control program are showing up in physical components and nontarget organisms of the environment, the levels do not appear sufficiently high to constitute an ecological problem. Final analysis of the 1972 data should be completed before the end of the calendar year 1973.

EMERGENCY PROGRAMS

Over 50 PPQ personnel were detailed to Veterinary Services (VS) in 1972 to help fight the exotic Newcastle poultry disease outbreak in southern California. They were assigned technical responsibilities in the diagnostic laboratory, fly control, regulatory action and sentinel bird placement.

PPQ also provided help for fly control in a hog cholera outbreak in Indiana. In April 1973, PPQ conducted—jointly with VS—a hog cholera vector control training course for 15 individuals from PPQ and VS.

When Hurricane Agnes struck Pennsylvania, it caused widespread flooding and destruction in the Wilkes-Barre area. PPQ personnel were engaged in handling supplies and operating part of the emergency radio network in the Wilkes-Barre area.

PPQ personnel also coordinated an aerial spraying program to control flies and other insects in Rapid City, S. Dak., following severe flooding conditions.

PPQ, jointly with the State of Florida, conducted an emergency exercise to test Federal-State response to a plant pest emergency. Over 40 State and Federal employees were involved. The knowledge gained from this exercise is being incorporated in an emergency procedures manual.



Figure 3—Automated gas chromatographs for detecting and measuring pesticide residue levels.



Figure 4—Spraying poultry house in southern California to control flies, transmitters of exotic Newcastle poultry disease.

EUROPEAN CHAFER

Spread of this insect during 1972 was relatively light, and no new county finds were reported. A public hearing was held in Baltimore, Md., on February 7, 1972, to receive views from State officials and other interested parties on whether to extend or to terminate the Federal quarantine. After consideration of all comments recorded at the hearing, the Federal quarantine was revoked effective September 30, 1972.

EUROPEAN CRANE FLY

An adult male crane fly was found at Renton, King County, Wash., in September 1972, about 75 miles south of the regulated area in that State. A comprehensive evaluation was made to determine the pest potential of this insect in the United States. The conclusion was that the crane fly would be of minor agricultural importance in its present habitat and probable projected range. Consequently, after reviewing comments from all State regulatory officials, Federal emergency crane fly regulations were revoked effective December 7, 1972.

GIANT AFRICAN SNAIL

New infestations comprising 14 properties were found May 23, 1972, and July 14, 1972. This brings the total number of infested locations found in Florida to nine. The two new outbreaks are in North Miami and Opa Locka, in the general vicinity of the several previously detected infestations.



Figure 5—Predator snail attacking a giant African snail in Hawaii.

A single snail was found on April 13, 1973. No snails have been found in any of the infested areas since then. The overall number of properties requiring treatment has been reduced to 76 from a maximum of 713.

An intensive program of property cleanup accompanies pesticide treatments. Homeowners cooperate in this phase of the program by removing leaves under hedges, disposing of trash, pruning of plants, and sealing up vents underneath their houses. Trash is collected and deposited at specific locations by the city sanitation department. These varied control measures, have eliminated damage by the giant African snail.

An intensive detection survey was initiated during 1972. More than 100 disadvantaged youths were provided by the Department of Labor's Summer Program for Action to Renew the Environment (SPARE). These "Urban Rangers" surveyed 5,993 properties with negative results.

An intensive publicity and public relations campaign was begun to assist in finding any unsuspected infestations. More than 150,000 colored brochures were mailed to Miami area homeowners. This campaign was directly responsible for detecting the new Opa Locka infestation. Since then, the campaign has been reinitiated with the assistance of the telephone company. A total of 530,000 leaflets describing the giant African snail were included with April-May 1973 phone bills.

GOLDEN NEMATODE

The objective of eradication of golden nematode from host cropland in the United States still appears valid. The country-wide biometrical survey has failed to show any infestation outside New York State. A considerable boost will be given to eradication in fiscal year 1974, when the nematode resistant potato variety Hudson (NY41) is

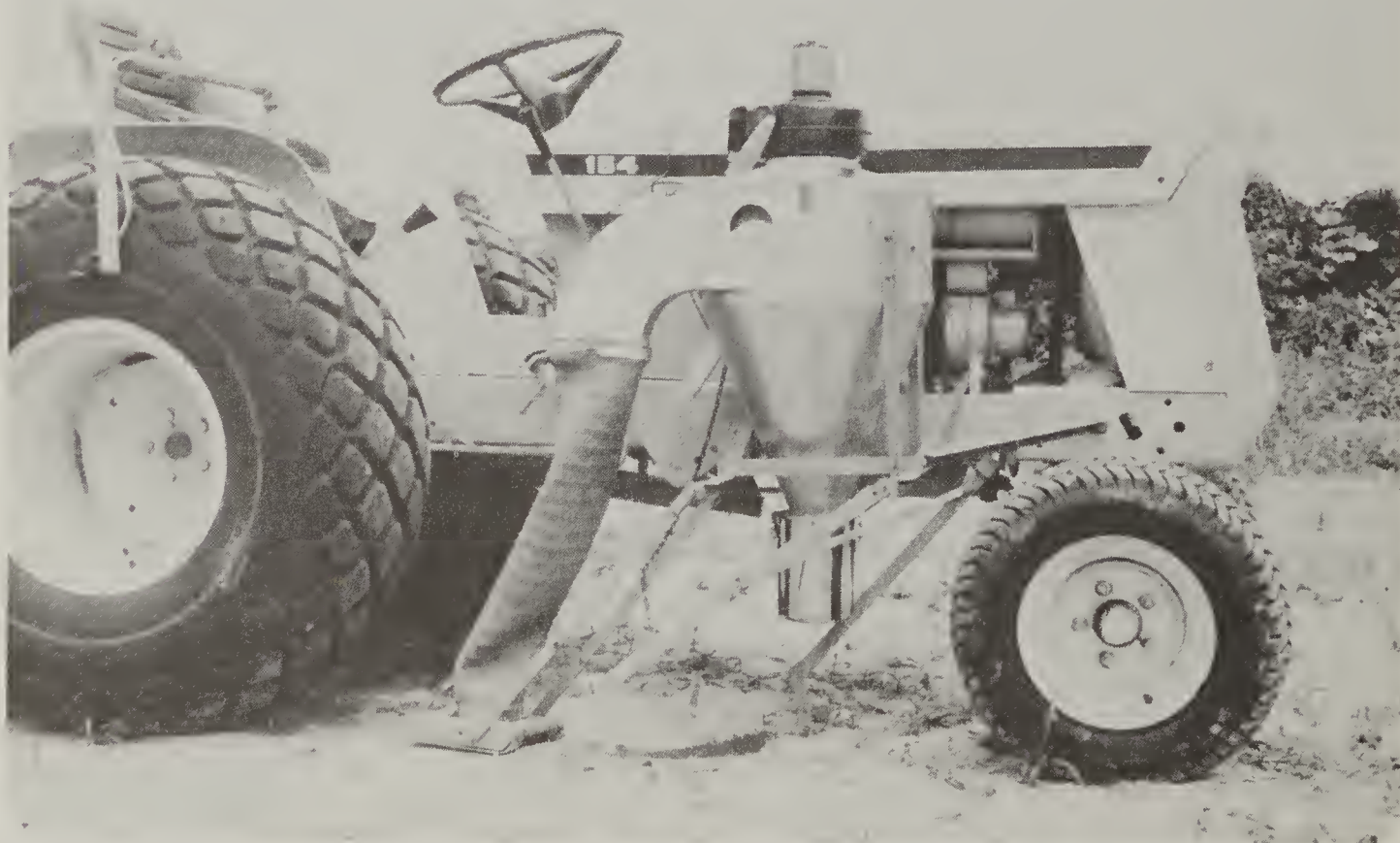


Figure 6—Vacuum soil sampler, developed by Methods Development, to facilitate collection of soil samples in cyst nematode surveying.

released for commercial planting and the systemic nematicide Furadan is registered for use on potatoes. The mechanical soil sampler has been developed to the point where it is expected to be in full field use in FY 1974.

During the reporting period, 976 acres were fumigated on Long Island using Vorlex® and D-D.® Except for the experimental farm and immediate area around it, all surveys in Steuben County have been negative since 1968.

GRASSHOPPER AND MORMON CRICKET

Grasshopper nymphal surveys in suspect areas during the spring of 1972 confirmed earlier estimates of extensive acreages with economic populations. A total of 2.2 million acres required control in six Western States and Oklahoma in calendar year 1972. Idaho and Oregon accounted for about 2 million acres. Ultralow-volume malathion was used at the rate of 8 ounces per acre. Control was generally good.

The 1972 adult surveys showed economic populations of eight or more grasshoppers per square yard on 15,337,582 acres in 17 Western and Midwestern States.

Spring nymphal surveys in 1973 revealed that large numbers of grasshoppers had successfully overwintered in many of the States where the previous adult inspections indicated widespread infestations.



Figure 7—These five DC-3 and DC-4 Constellations treated a total of 728,450 grasshopper-infested acres between June 22 and July 4, 1973.

Weather conditions in the Northwestern States were favorable for an early hatch. Population suppression was necessary in Washington, Idaho, and Nevada during June 1973 on 942,000 acres (831,000 in Washington). An unusually long hatch was reported in many rangeland States as the season progressed. Inspectors reported finding first-instar nymphs along with adults at the same locations.

Surveys for Mormon cricket showed infestations of 13,000 acres in Idaho, Montana, Nevada, and Oregon. It was necessary to control Mormon crickets on 7,000 acres in Idaho—the largest infestation that has developed in the West for several years. Since there is an urgent need for a label for an environmentally acceptable control for this pest, a methods development test was initiated using malathion. Preliminary data indicates effective control at the 8-ounce-per-acre rate.

GYPSY MOTH

In the 1972 survey, traps were placed in a biometrically designed grid pattern in 17 States east of the Mississippi River. Additional traps were placed at selected sites in these and 21 other States. Some 120,000 traps were involved in the total effort with the majority, about 100,000, located east of the Mississippi. During the survey, male moths were trapped for the first time in 55 counties in 10 States. This included three new State records—Iowa, Tennessee, and West Virginia. Positive trap catches appeared to be associated with the movement of tourists and campers for the most part. Scouting around positive trap sites uncovered egg masses at two locations—Lorain county, Ohio and Isabella county, Mich.

Isolated infestations, involving 659 acres in Monroe County, N.Y., and 625 acres in Jefferson County, Pa., were aerially treated with Carbaryl (Sevin 4 oil) in 1972. Cooperative aerial control programs were completed in 1973 at the Michigan and Ohio infestations. In Ohio 336 acres were treated with trichlorfon (Dylox 1.5 oil)® and in Michigan 13,360 acres were treated with carbaryl (Sevin 4 oil).®

In the continuing program to reduce hazardous pest populations at infested campsites, military facilities, and other areas in the northeast, aerial applications of insecticides were completed on 15,876 acres in 1972 and on 22,332 acres in 1973. Additional acreage of this nature was treated with ground equipment. Insecticides used were carbaryl (Sevin 4 oil,® Sevin 80S)® and trichlorfon (Dylox 1.5 oil).®

A quarantine evaluation survey was conducted in the summer of 1972, in cooperation with the States of Delaware, Maine, Maryland, New York, Pennsylvania, and Virginia, to obtain data on the hazard of spreading gypsy moth through movements of recreational vehicles. In this program, 13,612 vehicles were inspected at rest areas along major highways leading out of the generally infested area, and evidence of infestation was found on 153, or approximately 1 percent of the total inspected. The work in Delaware, Pennsylvania, and Virginia was partially financed by money from the Interstate Compact Fund.

The Methods Development Laboratory at Otis Air Force Base, Cape Cod, Mass., continued to screen and field test insecticides that show potential for control of the gypsy moth. Tests with *Bacillus thuringiensis* applied by aircraft resulted in good foliage protection at higher dosages, but significant larval populations remained after treatment. Biometrically designed tests were conducted to determine trap range and to ascertain the practicability of correlating trap catches with degree of infestation present in an area. Partial data analysis indicates trap range may be in excess of 1½ miles.

The synthetic sex attractant disparlure was field tested in 1972 to evaluate its effectiveness for control purposes. It has been postulated that disparlure applied to a very lightly infested area may inhibit mating by confusing male moths or overwhelming their scent receptors. While the 1972 tests were generally inconclusive, indications were that the basic premise was feasible. A late-season field test using a microencapsulated disparlure formulation showed promise and further tests are scheduled for 1973.



Figure 8—Mist blowing in a recreation area to reduce the hazard of artificial spread of the gypsy moth.

The Federal quarantine was revised in June of 1972 to include the States of Delaware and Maryland, small portions of which were regulated. Another revision of the quarantine regulations in April 1973 extended the regulated areas in Maryland, New York, and Pennsylvania.

The New Jersey Department of Agriculture, under a cooperative agreement with USDA, reared and distributed 2,186,000 parasites of various species to 12 States. The Parasite Introduction Branch, ARS, USDA, imported 17 new parasite species from Europe and released them to the New Jersey facility for large-scale rearing and colonization.

IMPORTED FIRE ANT

The Environmental Protection Agency (EPA) continued the registration of mirex for imported fire ant aerial spraying following recommendations of the Mirex Advisory Committee. Labeling restrictions were imposed to minimize environmental contamination. Treatments of estuaries and other aquatic habitats, wildlife area and heavily forested areas were avoided.

Mirex bait treatments are made in the early spring and fall. Before actual control treatments are applied, it is determined that ants are present in sufficient quantity and location to interfere with agricultural operations and/or to be a health problem and a nuisance. Monitoring is a part of each control operation and is designed to determine the efficacy of the treatment and possible paths of mirex residue movement within the environment.

During the past 18-month period, 22.5 million acres were aerially treated with mirex bait. The treatments were effective in controlling the ants.

EPA issued a notice in the Federal Register on April 4, 1973, calling for a public hearing to determine if the registrations of mirex should be cancelled or amended. The hearing is expected to be held in the fall of 1973.

The quarantine regulations have been revised to delete from the list of regulated articles the following: Compost, decomposed manure, humus, muck, peat, logs, pulpwood and stumpwood. These articles were deleted because they present little or no hazard of spread of the pest the way they are presently being handled.

There has been a minor outward movement of the ant by natural flights. Surveys revealed 3,099,385 additional acres infested during this reporting period.

JAPANESE BEETLE

During the 1972 survey, adult beetles were trapped for the first time in 36 counties in 12 States. However, in at least five of these counties—in Arizona, Iowa, Minnesota, and Wisconsin—the beetles were considered to be hitchhikers.

Cooperative Federal-State treatments were applied to suppress populations at infested sites in six States. This involved soil applications of chlordane to 4,188 acres and carbaryl foliar sprays applied to 4,400 acres including some acreage receiving repeat applications.

Milky disease spore dust was applied to 1,298 acres at several infested airports from which beetles could be spread as hitchhikers in departing aircraft. A military aerial spray unit applied carbaryl (Sevin 4 Oil) to 2,100 acres at Patuxent Naval Air Station, Md., and to 5,400 acres (in two treatments) at Dover Air Force Base, Del., to suppress adult beetle populations. These programs were carried out at the request of and under the direction of Plant Protection and Quarantine personnel.

At the request of the Portuguese Government and the U.S. Department of Defense, military and PPO specialists visited the island of Terceira in the Azores to recommend and initiate action to cope with an infestation of Japanese beetle. The island is the location of Lajes Air Force Base, a U.S. Air Force facility, and it is believed that beetles may have entered in the past on arriving aircraft. Survey was initiated with traps supplied by PPO. Control operations will be contingent on results of the survey.

Following a public hearing in Memphis, Tenn., on February 15, 1972, the Federal quarantine was revised effective November 16, 1972, to include the States of Alabama and Missouri. The regulated area in certain other quarantined States was extended following evaluation of survey results.

KHAPRA BEETLE

Grain storage facilities in the United States and Mexico remain free of the khapra beetle. It has been 7 years since the last established infestation in the United States was found and eradicated. The Federal khapra beetle quarantine was terminated Sept. 2, 1972.

In Mexico, a foreign ship from Africa unloaded infested shelled corn into 260 railroad cars. This required fumigation of 2,957,329 cubic feet in railroad cars at Tampico and Veracruz. A second ship with infested corn was prohibited from unloading and departed.

Three regulatory actions were required of exposed material unloaded from an infested ship in the United States. Burlap and Hessian cloth required fumigation in Indiana and North Carolina and cotton duck inspected in West Virginia was found free of beetles.



Figure 9— Imported fire ant mounds prevent full use or enjoyment of rural and urban properties.

MEDITERRANEAN FRUIT FLY

Intensive detection surveys were concentrated in high hazard areas of the United States—principally in Florida, California, Arizona, Texas, and Louisiana—and in Southern Mexico. The objective of the program is immediate detection of any introduction of the pest into the continental United States or Mexico.

During this period, 16,695 traps were placed at 61,377 different sites in the United States. In Mexico 3,392 traps were used and placed at 6,878 sites. No Mediterranean fruit flies were detected in the continental United States or Mexico.

A contingency plan for joint emergency action has been prepared, and approved in principle by the Direccion General de Sanidad Vegetal, Mexico, and PPQ for use in the event of invasion of the fly from Central America.

METHODS DEVELOPMENT LABORATORIES

Plant pest survey, regulatory, and control activities are dynamic; therefore, constant developmental work is required to keep abreast of new and changing needs. The methods development group conducts an organized applied research and development program oriented to program needs. The basic objectives of this group are to answer immediate problems which arise in program operations and develop new approaches to attain the objectives of Plant Protection and Quarantine programs. Current efforts include establishing new and revising the old treatment procedures and schedules for fumigants, insecticides, cold treatments, irradiation, and commodity tolerances; developing more effective controls through the use of chemicals, biologicals, parasitoids, sterile insects, and pheromones; and developing and testing new or improved detection tools such as mechanized soil samplers, traps, and pheromones.

The Methods Development group also has the responsibility of organizing and directing large-scale field trials.

MEXICAN FRUIT FLY

Detection surveys were conducted in Arizona, California, Florida, Louisiana, and northwest Mexico. There were 380 detection traps in operation in northern Mexico and 111 traps in southern Texas where surveys are conducted for population assessment. Three native flies were trapped in Tijuana and Ensenada, Baja California, Mexico, in 1972 and one native fly was trapped in Tijuana in the spring of 1973. Between June and November, over 700,000 sterile flies are released per week in northwest Mexico to overflow any native flies that became established after reaching northwest Mexico in infested contraband fruit.

In 1972, three native flies were trapped in La Paz, Baja California del Sur. Sterile fly releases were initiated in La Paz and 100,000 flies were released per week between July and November 1972. In June 1973, one native fly was trapped in La Paz.

Twenty-one native flies were trapped at six locations in the San Diego area of southern California in 1972. None were trapped in southern California during the spring of 1973.

One native Mexican fruit fly was trapped in Sarasota, Fla., February 23, 1972. Trapping was increased to 144 traps per square mile immediately surrounding the catch site and lesser numbers of traps were installed as far north as St. Petersburg and south to Ft. Myers. Following more than 90 days of negative survey, trapping was reduced to the normal trapping intensity.

Nearly 100,000 sterile flies per week were provided to Mexico's Sanidad Vegetal in an effort to eliminate Mexican fruit fly from an isolated valley near Oaxaca in southern Mexico where mangoes are the principal host. By June 30, 1973, populations were reported to have been greatly reduced.

In calendar year 1972 and the first half of 1973, fumigations involving 374.3 million pounds of citrus fruit were certified by PPO inspectors for shipment from Mexico to the United States and other countries. Shipments from south Texas required supervision of 1,738 fumigations and 1,275 compliance checks.

ORIENTAL FRUIT FLY

A single male oriental fruit fly was trapped in Santa Barbara, Calif., June 1, 1972. A second fly was detected on October 10 at Tustin, Orange County.

Immediately following detection, a project area was established comprising 81 square miles. Traps were placed at the rate of five per square mile throughout the area. Within each project area, a core zone of 9 square miles was designated where treatments were applied.

After trapping for 2 weeks in the core zone for delimiting purposes, eradication treatments were begun. At 600 selected bait stations in each square mile of the core zone, four applications of a toxic lure bait consisting of methyl eugenol and naled plus a thickening agent were made at 2-week intervals. The bait applicator was an ordinary squirt-type oil can. The bait was applied at a rate of 3 to 5 ml. per bait station. At the completion of baiting, trapping continued in the project area until three fly generations had elapsed. No additional flies were caught.

PEACH MOSAIC

The cooperative peach mosaic program has reduced the incidence of the disease to a very low level. The vector of the disease is now known to be a mite that can be controlled by the grower. Federal participation in the program was terminated June 30, 1972.

PEST MANAGEMENT

The cooperative pest management program was initiated in 1971 with the funding of two projects. Twenty additional projects were funded in 1972 and another 17 were added in 1973, bringing the total to 39 projects in 29 States. These are:

Alabama	cotton	Kansas	grain sorghum
Arizona	cotton	Louisiana	cotton
Arkansas	cotton	Maryland	sweetcorn
California	cotton		beans
	pears	Michigan	apples
Delaware	peppers	Mississippi	cotton
	potatoes	Missouri	cotton
Florida	citrus		corn
Georgia	cotton	Nebraska	corn
Idaho	potatoes		grain sorghum
Illinois	corn	New Jersey	sweetcorn
Indiana	corn		lettuce
	alfalfa	New Mexico	cotton
Iowa	corn	New York	apples

North Carolina	tobacco	South Carolina	cotton
	cotton	Tennessee	cotton
Ohio	corn	Texas	cotton
Oklahoma	cotton		grain sorghum
	grain sorghum		peanuts
	peanuts	Washington	alfalfa seed
Pennsylvania	apples		deciduous fruit

Plant Protection and Quarantine Programs cooperates with the Extension Service, State experiment stations, State departments of agriculture, and local growers in this program. The objective is to develop and implement an integrated system of pest population suppression methods, these include biological, cultural, varietal cropping systems, production practices, and chemicals to prevent economic damage to crops and thereby achieve a lower cost of production and a minimum of environmental pollution.

PEST SURVEY AND TECHNICAL SUPPORT

There are 43 States with cooperative survey agreements. Fourteen of these are modified agreements. Special detection surveys using light traps were conducted around major ports of entry. A total of 283 blacklight traps were operated at 163 locations considered highly hazardous as entry points for foreign pest introductions.

The detection work was further strengthened by training workshops; four were held in FY 1973. In addition 29 outside courses in entomology were taken by personnel between January 1972 and July 1973. At the PPO Training Center, Battle Creek, Mich., 33 individuals took entomology courses and 33 took plant pathology courses during FY 1972 and eight individuals took entomology courses in FY 1973.

During the last half of FY 1972 six pests new to the United States were reported through the Cooperative Economic Insect Report. Of these, two were reported in Florida (a cecidomyiid midge and a phytoceiid mite), two in Hawaii (a pentatomid bug and a megostigmatic mite), and one each from Maryland (a weevil) and Tennessee (an aphid). Of the two from Florida, the cecidomyiid midge could be beneficial but nothing is known about the phytoceiid mite. The pentatomid bug reported from Hawaii is injurious to rice and soybeans in Japan and has been recorded as a pest of rice in Malaya. Nothing is known about the megostomatic mite which previously had only been reported from England. The weevil in Maryland could be beneficial on thistle. Nothing is known about the economic potential of the aphid reported from Tennessee. There were 42 new State records of species already known to occur in the United States.

During FY 1973 there were 12 pests reported for the first time in the United States through the Cooperative Economic Insect Report. Seven of these were found in Hawaii—an elaterid beetle, a reduviid bug, a bruchid, a encyrtid wasp, a cylindrical bark beetle, a sepsid fly, and a stratiomyid fly. The encyrtid wasp could be beneficial, but nothing is known concerning the economic importance of the others.

New U.S. records also included a thrips in California, a sugarcane weevil in Florida, a plant bug in Pennsylvania, an aphid in Utah, and a thrips in Washington. The plant bug reported in Pennsylvania could be injurious to pine, while the sugarcane weevil from Florida could be a pest on sugarcane. A thrips reported from California could be an economic pest of citrus. The other species are either noneconomic or nothing is known of their economic potential. A thrips reported from Florida was a new continental U.S. record. However, in Hawaii it has been reported damaging orchids and as a minor pest of garden beans. There were 87 new State records of species already known to occur in the United States.

In FY 1972 the Technical Support Staff processed 93 applications from importers to import 60 different fruit and vegetables from 23 countries; 58 of the applications were approved while 35 were denied. During 1973, 72 applications were processed to import 49 different fruit and vegetables from 30 countries; 47 applications were

approved and 25 disapproved. During FY 1972, the Technical Support Staff and the Plant Importation Office, Hoboken, N.J., issued Federal Plant Pest Act (FPPA) permits as follows: Cultures and diseases 554, insects 493, and soil 138. In FY 1973, FPPA permits were issued as follows: Cultures and diseases 471, insects 431, and soil 168.

During FY 1973, 24 inspectors at ports of entry were given final authority to identify 181 plant diseases and 130 inspectors were given similar authority for 1,022 insects. Discard authority is given to personnel when they have demonstrated that they can identify intercepted pests.

During FY 1972-73 a total of 287,321 identifications of intercepted plant pests, including insects, mites, snails, diseases and nematodes, were made. Of these 152,394 were identified by inspectors at ports of entry, 90,404 by identifiers, and 44,523 were referred to specialists for identification or confirmation.

PHONY PEACH

After consideration of progress made, current status, and benefits to be gained by continued Federal participation in this program, a decision was made to withdraw Federal support as of June 30, 1972.

PINK BOLLWORM

The sterile release control program continued in the San Joaquin Valley of California in the summer of 1972. Approximately 99 million moths were dropped into the area by aircraft from May 27 through November 10, 1972. The sterile moth technique is under test as a control and/or eradication method to prevent establishment of pink bollworm populations of economic importance in this Valley.

A total of 36 native adults were trapped in two counties in the San Joaquin Valley in 1972. No larvae were found. Approximately 46,000 traps were placed in the cotton-growing area at the rate of one trap per 20 acres of cotton. The numbers of moths trapped and locations exceeded previous totals. This was not unexpected considering the increased trap density (8,000 in 1971 and 46,000 in 1972) and uniformity of placement throughout the Valley. The low level infestations found in 1972 and previous years were contained by this technique.

Mass rearing, sterility, and release techniques of pink bollworm are under continuing investigation. Population dynamics studies continue in sterile-male tests conducted in Nevada, as well as, field trials using a lower irradiation dose rate for sterilization. These tests have shown the statistically significant impact the technique could have on native populations. Optimism continues toward stabilizing the natural sex lure.

Major improvements in the mass rearing operations at Phoenix include: the use of an antibiotic in rearing diet, improved physical properties of diet-eliminating moisture problems, egg processing techniques, and the use of hexcel for pupation instead of cotton lint. The parasite phase of the Nevada test and the introduction of the egg-larval parasite into wild cotton in Florida are proceeding satisfactorily.

A methods development test on the Florida Keys using the sterile moth technique instead of removing wild cotton plants was completed. Results indicated suppression of native populations of pink bollworms through sterile releases was at least as effective as physically removing plants. Due to many problems associated with roguing cotton plants the sterile release program replaced the destruction of wild cotton in Florida on November 13, 1972. Traps are used to monitor program effectiveness. A new rearing facility is under construction in Texas to furnish moths for the Florida program. This new laboratory has incorporated significant improvements into its rearing procedures.

An appraisal of the pink bollworm program has been completed, with the exception of a more detailed review of the regulated articles, which is in progress. Some of the recommendations have been implemented and others require concurrence of cooperators. All recommendations are scheduled for implementation by December 1973.

PORT OPERATIONS

Port operations plays an important role in protecting the Nation's agricultural crops, forests, and ornamental plantings against additional agricultural pests. Its principal responsibility is to guard against the entry of harmful foreign plant and animal pests into the United States. It is also charged with the responsibility of preventing the movement of plant pests from offshore U.S. areas to the mainland and between such areas. In addition, inspectors in the program examine American-grown plants and plant products offered for export and certify such shipments to meet the entry requirements of importing countries. These responsibilities are accomplished by inspection staffs at major ports of entry, where inspectors work in cooperation with other border clearance agencies in the examination of passengers, their baggage, and means of conveyance. Cargoes of both agricultural and nonagricultural nature are also inspected. Treatments or other safeguards may be applied to insure that harmful pests do not enter the United States. Foreign mail parcels are inspected in cooperation with U.S. Customs Service.

New biometrically designed inspection techniques have been developed to assist inspectors in handling the ever-increasing volumes of fruit and vegetable importations. The inspection of biometrically selected samples provides a more effective inspection, reduces inspection time, and provides better security against pest introductions.

An important activity involves the preclearance of agricultural commodities in countries of origin under cooperative agreement between foreign exporters and APHIS. Personnel inspect and/or supervise the treatment of various commodities to meet U.S. entry requirements. This service is at the request and expense of the exporters and benefits American agriculture by eliminating the pest at the source.



Figure 10—PPQ inspector examining air cargo for hitchhiking agricultural pests.

In order to keep pace with the ever-increasing movement of carriers and cargoes to interior U.S. destinations, the cross-utilization of APHIS inspectors, including those representing PPQ domestic programs and Veterinary Services, has become an important facet of this program.

The use of cooperative memorandums of agreement with shipping lines is an important and recently developed regulatory tool. It provides for agreement by shipping lines to maintain only permissible produce and meats in their ships' stores, thereby reducing the number of boardings by inspectors, the amount of prohibited products requiring sealing, and the surveillance time required for supervising garbage removal. As the number of carriers entering into a compliance agreement increases, more inspection time is gained for use on higher-risk activities.

The training of Military Quarantine Inspectors (MQI) continues to be an important responsibility. MQI's help assure that clean, noninfested military cargo is returned from overseas locations.

PROFESSIONAL DEVELOPMENT

The Professional Development Staff (PDS) was established in January 1973. Prior to this there was a coordinated training program between the Training Center Staff at Battle Creek, Mich., and the AQI and PP training representatives in Hyattsville, Md. The PDS became responsible for all training and development programs, career promotion programs, and for coordinating various employee related activities such as Equal Employment Opportunity, Labor-Management Relations, and Safety.

During the reporting period, several new courses were developed and conducted. These indicate the versatility and challenge facing the training staff. As examples, a course in report writing was designed and conducted for 64 Michigan State employees; programmed instruction and classroom training in environmental impact was developed and presented; a seminar in "Modern Concepts of Plant Protection and Quarantine" was initiated for new managers to update their technical knowledge; administrative training for new supervisors was implemented and supervisory training required by Civil Service Commission was expanded and given to several hundred PPQ supervisors.

A number of technical courses, some old and some new, were given. These include cross-utilization training for PPQ inspectors in performing foreign arrival clearance of lighter abroad ship (LASH) barges and aircraft, advanced insect identification training, and basic training for inspectors performing AQI duties. For foreign nationals there have been three 12-week courses teaching them plant quarantine regulations, procedures, treatments, and identification of pests and diseases. Also, a course on treatment methods was developed and conducted for FAO participants from the Caribbean Plant Protection Region. Several training programs and visual aids have been prepared and utilized for various quarantine operations by military personnel.

During the reporting period, almost 48,000 man-hours of training were provided to participants. This training was supplemented by a variety of courses and developmental experiences in a wide range of subjects outside PPQ.

RANGE CATERPILLAR

Light to heavy infestations were reported in Lincoln and Chaves Counties, N. Mex., in 1972. Approximately 300,000 acres were infested. Spotted infestations were also found in Harding, Colfax, and Union Counties. Some ranchers were interested in cooperative control programs, however, no cooperative organized control effort developed. It was reported that some ranchers contracted for an undetermined acreage to be sprayed. Considerable interest in control was expressed in several New Mexico counties again in 1973. Plans were being made by the end of June 1973, for a cooperative control program involving range caterpillar infestations in combination with grasshoppers.

Cooperative tests were conducted in Union County, N. Mex. during July and August 1972. An unfortunate overspray of all plots with toxaphene by the ranchers allowed for only minimal post-treatment observation time for the fast-acting trichlorfon and completely inadequate time for the slower-acting, but potentially good treatments of *Bacillus thuringiensis* (Bt), carbaryl and leptophos. The test supports earlier data that trichlorfon in oil is fast-acting and is capable of obtaining acceptable kills of this pest. Sufficient efficacy data was submitted for registration of trichlorfon. An additional test to screen new chemicals is planned in New Mexico during July 1973.

SOYBEAN CYST NEMATODE

The soybean cyst nematode has spread throughout most of the area where monocultural practices are followed in soybean production. The nematode can be controlled through a crop rotation system and in some areas by the use of resistant varieties. Therefore, it was determined to withdraw Federal support of the soybean cyst nematode program and the Federal Quarantine was revoked on September 16, 1972.

SWEETPOTATO WEEVIL

Experience has shown that the most effective method of control for the sweetpotato weevil is sound cultural practices. Funds are not put to the best use to enforce regulations when cultural controls are available to farmers within a State for effective control of a pest. The information on cultural practices has been available for several years and farmers have had opportunity to become informed of the benefits of a cultural control program. Accordingly, PPQ withdrew from the program June 30, 1972.

WEST INDIAN SUGARCANE ROOT BORER

Efforts to contain this pest and retard its spread continue. This is being accomplished by joint action of the Division of Plant Industry, Florida Department of Agriculture and Consumer Services and PPQ. Foliar applications of insecticides were made to 39,862 aggregate acres of citrus. All newly discovered infested areas are treated with soil insecticides. Soil replenishment treatments were applied to all previously infested areas. Total aggregate acreage to which soil insecticides were applied is 5,042. Plans have been developed to conduct field trials in Puerto Rico using promising materials for foliar application which have been screened by ARS.

This insect has now been found on nine species of alternate hosts, mostly along roadsides. One area consisting of 25 acres containing mostly sumac was found to be infested. More than 500 new acres of infested citrus have been detected bringing the total infested citrus acreage to 2,268.

A State quarantine regulates movement from the infested area of articles considered to be hazardous. PPQ inspectors assist the State in its enforcement. During the fruit shipping season, State or Federal inspectors are stationed at packing sheds to assure that no hitchhiking adult borers accompany fruit movement and that leaves which could harbor eggs are removed and destroyed.

WHITE-FRINGED BEETLES

Adult white-fringed beetles were collected for the first time in eight counties and parishes in five southern States currently under Federal quarantine.

Eight Georgia counties and four Louisiana parishes were found infested and placed under regulation on April 24, 1973. In addition, certain previously regulated articles were removed from regulation after study showed such articles were no longer hazardous due to changes in commercial handling and storage procedures.

Control treatments with chlordane or dieldrin were completed on 870 acres to reduce spread from outlying infested sites. Carbaryl foliar sprays were applied against adults to supplement soil treatments.

Patterns of damage to crops in infested areas show no distinct change. Damage, involving plant destruction and reduced yields in row crops were reported as sporadic and occurring on small, scattered acreage in infested areas.

Where populations of the insect resistant to dieldrin exist in ornamental tree nurseries, certification treatment trials using multiple applications of dyfonate in combination with a residual soil insecticide were effective. Some nurseries near Semmes, Ala., are affected and treated with dyfonate.

In April 1973 the entire white-fringed beetle program was reviewed with members of the National Plant Board. As a result, a public hearing was scheduled for September 1973 to consider the advisability for continuing the Federal quarantine on this program.

WITCHWEED

The cooperative quarantine and control program continues to reduce witchweed infestations in North Carolina and South Carolina. During this reporting period, four entire counties were removed from regulation, two from each State.

Success of the witchweed program has led to the adoption of an intensive suppression program on 15,000 acres around the outer periphery of the infestation. Survey and control procedures developed by the Witchweed Laboratory will be utilized on the suppression program. As areas are removed from regulation, suppression will be extended to additional areas. Meanwhile, sufficient control operations will be carried out in the core area to keep seed production at a minimum.

Statistical Summaries on Selected Programs
Agriculture Quarantine Inspection—January 1, 1972 - June 30, 1973

		1973	1972
I.	<i>Airplanes</i>		
	Inspected upon arrival	275,698	263,888
	With prohibited material	119,104	108,734
	Travelers' bags processed	42,557,923	38,028,523
	Inspected before departure ¹	47,737	50,639
	With prohibited material	19,575	20,409
	Travelers' bags processed	9,891,079	10,354,143
II.	<i>Ships</i>		
	Boarded and inspected	77,295	70,794
	With prohibited plant material	32,848	30,948
	With prohibited animal products	37,532	31,390
	Travelers' bags processed	3,975,112	3,717,389
III.	<i>Mexican Border</i>		
	Vehicles entering	41,000,499	39,320,955
	Railroad cars entered ²	75,044	64,886
	Pieces baggage & mandado processed ³	43,389,707	42,415,050
IV.	<i>Mail</i>		
	Foreign packages entering	69,097,580	60,982,085
	Packages of agriculture interest	171,046	183,747
	Packages refused entry	1,704	1,447
	Domestic ⁴ mail packages processed	6,207,487	5,817,957
	Packages of agriculture interest	29,478	38,461
	Packages refused movement to mainland	365	284
V.	<i>Cargo Inspection</i>		
	Entries under permit	150,089	133,864
	Man-hours devoted to inspect non-permit cargo	103,616	97,232
	Pieces treated or cleaned	5,672,755	5,225,212
	Export certificates issued	68,373	60,467
	Pieces of aircargo processed	3,663,559	3,290,061
VI.	<i>Quarantine Material Interceptions</i>		
	Plant material (pieces)		
	Intercepted from:		
	Baggage	336,883	309,360
	Cargo	2,779	3,271
	Mail	2,414	1,975
	Carrier Quarters	37,036	35,674
	Carrier Stores	298,018	290,447
	Total	677,130	640,727
	Animal byproducts (pounds)		
	Intercepted from:		
	Ship passenger baggage	15,713	4,545
	Air passenger baggage	151,885	87,116
	Mail and express packages	14,005	22,139
	Mexican border and others	187,825	81,095
	Total	369,428	194,895
VII.	<i>Plant Pest Interceptions of Quarantine Interest</i>		
	Insects	29,600	31,722
	Disease (includes nematodes)	4,580	5,951
	Other (includes mites and snails)	2,886	2,948
	Total	37,066	40,621

Agriculture Quarantine Inspection—January 1, 1972 - June 30, 1973—Continued

VIII. <i>Animal Byproduct Importations</i>	<i>1973</i>	<i>1972</i>
Restricted entries	1,257	3,721
Pounds	112,112,105	165,055,541
Unrestricted entries	27,208	17,977
Pounds	529,522,066	409,087,156

IX. *Propagative Material Importations (Includes Departmental)*

	<i>Entered</i>	<i>Postentry</i>	<i>Treated</i>	<i>Refused Entry</i>
	<i>1973</i>			
Shipments	9,051	694	2,130	252
Plant Units	40,689,970	213,599	31,750,558	44,467
Seeds	380,363	11,208	129,590	190
	<i>1972</i>			
Shipments	8,214	775	2,593	217
Plant Units	30,234,166	121,741	19,821,627	26,868
Seeds	370,998	176	225,003	1

- ¹ Planes inspected in Hawaii, Puerto Rico, the Virgin Islands, Bahamas, and Bermuda before departure for the U.S. mainland.
² Excludes tank and hopper cars.
³ Mandado includes bags containing groceries & miscellaneous merchandise.
⁴ Mail preinspected at offshore locations.

Boll Weevil—January 1, 1972 - June 1973

United States and Mexico	Survey and detection	Control			
	Acres visually surveyed	Malathion	Acres treated		Carbaryl
			Guthion	Temik	
Alabama	--	--	112,166	--	--
California	200	--	--	--	--
Texas	990,490	514,666	--	791	--
Mexico	9,054	2,257	--	--	55

Cereal Leaf Beetle—January 1, 1972 - June 30, 1973

State	Survey and detection	Control
	Area surveyed	Parasite release sites
	<i>Acres</i>	<i>Numbers</i>
Alabama	8,348	---
Arkansas	16,725	---
Connecticut	172	---
Delaware	2,051	---
Florida	444	---
Georgia	4,217	---
Illinois	14,536	2
Indiana	4,706	150
Iowa	23,560	---
Kentucky	913	3
Louisiana	438	---
Maine	150	---
Maryland	3,648	---
Massachusetts	1,942	---
Michigan	---	27
Minnesota	3,210	---
Mississippi	7,431	---
Missouri	8,831	---
New Hampshire	50	---
New Jersey	1,107	---
New York	250	5
North Carolina	13,396	---
Ohio	---	115
Oklahoma	12,305	---
Pennsylvania	75	21
Rhode Island	430	---
South Carolina	26,273	---
Tennessee	21,816	---
Texas	5,945	---
Vermont	300	---
Virginia	5,712	55
West Virginia	---	163
Wisconsin	11,990	---
Total	200,971	541

Citrus Blackfly—January 1, 1972 - June 30, 1973

United States and Mexico	Survey and detection		Control	
	Trees Examined	Trees Infested	Host Plants Treated	Parasites Released
United States				
Arizona	1,212	--	--	--
Texas	161,135	463	372,924	--
Mexico	7,543,366	366,533	398,822	--
Total	7,705,713	366,996	771,746	--

Grasshopper Control—January 1, 1972 - June 30, 1973

State	Survey and detection	Control
	Acres infested*	Acres treated
Arizona	17,000	--
California	84,700	2,830
Colorado	580,120	--
Idaho	2,130,660	1,265,458
Kansas	350,000	--
Montana	182,450	--
Nebraska	501,000	--
Nevada	8,300	30,985
New Mexico	5,354,920	--
North Dakota	15,900	--
Oklahoma	1,485,000	119,926
Oregon	2,065,960	818,761
South Dakota	25,400	--
Texas	1,261,060	--
Utah	16,572	--
Washington	1,044,780	845,680
Wyoming	213,760	68,237
Total	15,337,582	3,151,877**

*Adult survey 1972.

**Includes 120,346 treated January - June 1972 and 3,031,531 acres treated FY 1973.

Gypsy Moth—January 1, 1972 - June 30, 1973

State	Survey and detection	Control		Regulatory	
	Sites trapped	Area treated chemically	Parasites released ¹	Nursery and other inspections	Commodity treatments
	<i>Number</i>	<i>Acres</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Alabama	2,231	-----	-----	5	7
Arizona	50	-----	-----	6	-----
Arkansas	616	-----	-----	5	5
California	6,852	-----	-----	46	10
Colorado	-----	-----	-----	13	2
Connecticut	-----	-----	-----	4,590	858
Delaware	1,400	-----	155	30	22
District of Columbia	46	-----	-----	-----	-----
Florida	3,901	-----	-----	438	111
Georgia	2,305	-----	-----	51	11
Idaho	25	-----	-----	4	4
Illinois	1,720	-----	-----	12	14
Indiana	1,459	-----	-----	21	16
Iowa	892	-----	10	-----	4
Kansas	-----	-----	-----	9	-----
Kentucky	1,841	-----	-----	12	3
Louisiana	773	-----	-----	28	10
Maine	540	-----	-----	1,743	797
Maryland	10,622	-----	644	270	358
Massachusetts	2	30	-----	2,560	104
Michigan	7,596	14,380	10	4	36
Minnesota	107	-----	-----	-----	6
Mississippi	564	-----	-----	12	12
Missouri	1,354	-----	-----	3	9
Nebraska	972	-----	-----	8	-----
New Hampshire	31	-----	-----	444	631
New Jersey	-----	-----	725	3,210	2,169
New Mexico	23	-----	-----	5	2
New York	17,273	659	31	4,112	2,924
North Carolina	9,097	-----	83	85	28
North Dakota	20	-----	-----	-----	-----
Ohio	3,198	336	20	50	88
Oklahoma	201	-----	-----	8	5
Oregon	271	-----	-----	8	1
Pennsylvania	36,479	662	-----	7,118	1,581
Rhode Island	-----	-----	-----	1,524	34
South Carolina	4,599	-----	41	71	23
South Dakota	31	-----	-----	1	-----
Tennessee	3,685	-----	20	21	5
Texas	291	-----	-----	44	15
Utah	-----	-----	-----	3	-----
Vermont	95	-----	-----	536	938
Virginia	28,939	-----	322	211	32
Washington	467	-----	-----	20	9
West Virginia	11,507	-----	125	10	-----
Wisconsin	196	-----	-----	-----	1
Wyoming	100	-----	-----	4	-----
Total	162,371	16,067	2,186	27,355	10,885

¹ Units of 1,000.

Imported Fire Ant—January 1, 1972 - June 30, 1973

State	Survey & detection	Control	Regulatory			
	Area surveyed	Area treated	Nursery inspections	All other inspections	Commodity treatments	Pesticide treatments-soil
	<i>Acres</i>	<i>Acres</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Acres</i>
Alabama	399,603	1,744,872	3,627	1,126	1,566	7,515
Arkansas	209,658	52,040	14	2	-----	-----
Florida	13,369	99,460	3,302	1,248	7	1,888
Georgia	206,178	11,168,490	682	375	383	1,126
Kentucky	382	-----	-----	-----	-----	-----
Louisiana	404,469	2,869,152	3,145	752	91	1,332
Mississippi	2,742,242	4,953,789	1,335	2,169	1,257	640
North Carolina	2,647,121	965	359	785	247	43
Oklahoma	19,140	-----	-----	-----	1	-----
South Carolina	993,439	752,934	206	1,285	459	657
Tennessee	97,828	-----	-----	10	-----	-----
Texas	904,256	604,862	3,286	1,907	533	3,423
Virginia	9	-----	12	2	-----	-----
Total	8,637,694	22,246,564	15,968	9,661	4,544	16,624

Japanese Beetle—January 1, 1972 - June 30, 1973

State	Survey and detection			Control	Regulatory	
	Area surveyed	Sites trapped	Area infested outside regulated area	Area treated chemically	Area treated soil	Commodity treatments
	<i>Acres</i>	<i>Number</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Number</i>
Alabama	9,934	2,951	-----	-----	217	1
Arizona	-----	84	-----	-----	-----	-----
Arkansas	-----	350	-----	-----	-----	-----
California	-----	7,404	-----	-----	-----	-----
Colorado	-----	100	-----	-----	-----	-----
Connecticut	290	-----	-----	-----	827	215
Delaware	-----	851	-----	-----	60	20
District of Columbia	-----	-----	-----	-----	-----	62
Florida	84	67	-----	-----	-----	3
Georgia	332	2,533	346,300	-----	161	197
Hawaii	-----	23	-----	-----	-----	-----
Illinois	2	6,419	31,360	104	2	1
Indiana	14	4,574	218,760	-----	1,361	28
Iowa	95	3,359	-----	-----	-----	-----
Kansas	-----	151	-----	-----	-----	-----
Kentucky	808	1,916	7,270	-----	458	9
Louisiana	-----	339	-----	-----	-----	-----
Maine	4	200	-----	16	2	21
Maryland	150	-----	-----	-----	-----	10,469
Massachusetts	608	-----	-----	-----	15	108
Michigan	40	12,345	-----	3,701	1,217	11
Minnesota	-----	1,336	-----	-----	-----	-----
Mississippi	228	148	-----	-----	-----	-----
Missouri	1,481	2,079	-----	-----	1	-----
Nebraska	-----	111	-----	-----	-----	-----
Nevada	-----	14	-----	-----	-----	-----
New Hampshire	-----	-----	-----	-----	-----	23
New Jersey	317	-----	-----	-----	140	318
New Mexico	-----	6	-----	-----	-----	-----
New York	-----	-----	-----	-----	34	107
North Carolina	242	-----	-----	-----	1,408	1,522
Ohio	2,155	1,147	-----	77	1,257	5,697
Oklahoma	-----	45	-----	-----	-----	-----
Oregon	-----	252	-----	-----	-----	-----
Pennsylvania	20	-----	-----	-----	23	133
Rhode Island	75	-----	-----	-----	84	17
South Carolina	18,825	1,288	15,000	-----	135	405
South Dakota	-----	247	-----	-----	-----	-----
Tennessee	5,578	3,897	269,000	288	31	63
Texas	-----	121	-----	-----	-----	-----
Vermont	-----	-----	-----	2	-----	5
Virginia	-----	-----	-----	-----	1,424	248
Washington	-----	125	-----	-----	-----	-----
West Virginia	-----	-----	-----	-----	19	5
Wisconsin	-----	989	-----	-----	-----	-----
Total	41,282	55,471	887,690	4,188	8,876	19,688

Khapra Beetle—January 1, 1972 - June 30, 1973

United States and Mexico	Survey and detection	Control
	Properties surveyed	Cubic feet fumigated
Alabama	51	---
Arizona	1,230	---
Arkansas	19	---
California	1,775	---
Colorado	60	---
Connecticut	11	---
Delaware	4	---
Florida	9	---
Hawaii	12	---
Louisiana	134	---
Maryland	2	---
Massachusetts	9	---
Michigan	42	---
Mississippi	12	---
New Jersey	19	---
New Mexico	529	---
New York	14	---
North Carolina	22	---
Oklahoma	119	---
Pennsylvania	3	---
Rhode Island	5	---
South Carolina	12	---
Tennessee	32	---
Texas	118	---
Vermont	1	---
Virginia	7	---
Washington	11	---
Mexico	3,744	2,957,329
Total	8,006	2,957,329

Mexican Fruit Fly—January 1, 1972 - June 30, 1973

United States and Mexico	Survey Maximum no. of traps in use	Control Biological sterile flies released	Regulatory Commodity treatments supervised
United States			
Arizona	81	--	--
California	1,811	--	--
Florida	4,685	--	--
Louisiana	51	--	--
Texas	106	--	2
Mexico	855	33,440,000	10,427
Total	7,589	33,440,000	10,429

Pink Bollworm—January 1, 1972 - June 30, 1973

United States and Mexico	Survey and detection		Control	Regulatory
	Bloom-boll survey	Traps installed	Sterile moth released	Commodity treatments
United States	<i>Acres</i>	<i>Number</i>	<i>(Units of 1000)</i>	<i>Number</i>
Alabama	80	222	--	--
Arizona	9,481	--	--	262
Arkansas	--	3,705	--	133
California	36,305	71,817	129,912	42
Florida	--	1,159	43,992	--
Georgia	--	365	--	--
Kentucky	20	50	--	--
Louisiana	--	2,533	--	4
Mississippi	--	2,128	--	4
Missouri	--	480	--	--
Nevada	--	--	705	--
New Mexico	1,580	200	--	22
N. Carolina	--	106	--	--
Oklahoma	415	--	--	23
S. Carolina	--	313	--	--
Tennessee	5	1,602	--	5
Texas	52,248	--	--	654
East Mexico	35,650	--	--	--
West Mexico	12,968	3,225	--	64
Total	148,752	87,905	174,609	1,213

White-fringed Beetle—January 1, 1972 - June 30, 1973

State	Survey and detection		Control	Regulatory		
	Area surveyed	Area infested	Area treated ¹	Commodity treatments	Area treated	
					Soil	Foliage
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Number</i>	<i>Acres</i>	<i>Acres</i>
Alabama	57,682	5,060	585	216	10,486	16,992
Arkansas	3,856	200	-----	10	27	-----
Delaware	223	-----	-----	-----	-----	-----
Florida	620	40	-----	4	746	32
Georgia	8,551	871	-----	737	1,356	-----
Illinois	105	-----	-----	-----	-----	-----
Indiana	30	-----	-----	-----	-----	-----
Kentucky	1,018	5	80	-----	5	-----
Louisiana	7,344	3,058	157	84	1,008	2,266
Maryland	176	-----	-----	-----	-----	-----
Mississippi	4,637	-----	-----	830	577	-----
Missouri	5,435	8	2	-----	-----	-----
North Carolina	11,523	105	81	571	1,229	-----
Oklahoma	85	-----	-----	1	-----	-----
South Carolina	6,097	5	-----	26	129	-----
Tennessee	1,380	-----	-----	79	298	330
Texas	4,755	175	849	1	-----	-----
Virginia	1,319	5	-----	146	1,458	24
Total	114,836	9,532	1,754	2,705	17,319	19,644

¹ Includes soil and surface, and foliage.

PROGRAM QUANTITATIVE DATA

Fiscal Years—1970-1973

IMPORTED FIRE ANT

1. Acres Treated:

1970	14,083,959
1971	11,609,907
1972	11,065,153
1973	14,184,017

Total 50,943,036

Subdivided on 50/50 basis: Federal 25,471,518
State 25,471,518

2. Sites Monitored—initiated 1972

1972	350
1973	900

Total 1,250

KHAPRA BEETLE

Establishments Inspected (includes Mexico):

1970	8,324
1971	8,272
1972	7,236
1973	3,629

Total 27,461

CEREAL LEAF BEETLE

1. Acres Surveyed:

1970	197,889
1971	150,269
1972	135,638
1973	66,750

Total 550,546

2. Regulatory Inspections:

1970	9,455
1971	6,458
1972	6,845
1973	4,295

Total 27,053

3. Parasite Release Sites:

1970	46
1971	146
1972	167
1973	372

Total 731

RECAPITULATION: Fiscal Years—1970-1973

IMPORTED FIRE ANT

1. Acres Treated 25,471,518 (Federal only)
2. Sites Monitored 1,250

KHAPRA BEETLE

Establishments Inspected 27,461

CEREAL LEAF BEETLE

1. Acres Surveyed 550,546
2. Regulatory Inspections 27,053
3. Parasite Release Sites 731

